Building Communicative Competence with Individuals Who Require AAC: From Research to Effective Practice

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The silence of speechlessness is never golden. We all need to communicate and connect with each other – not just in one way, but in as many ways as possible. It is a basic human need, a basic human right. And much more than this, it is a basic human power.
(Williams, 2000; p. 248)

Goal of AAC intervention

- The goal of AAC intervention is to build communicative competence
- Allow individuals with CCN to participate fully in all aspects of life
  - Express needs and wants
  - Exchange information
  - Build social closeness
  - Participate in social etiquette routines

Goals of this session

- Discuss the skills that are required of individuals with complex communication needs to develop communicative competence;
- Summarize current research results on interventions to build these skills with children with complex communication needs (CCN).

Communicative Competence

- Communicative competence is defined as
  - "the state of being functionally adequate in daily communication and of having sufficient knowledge, judgment, and skills to communicate effectively in daily life" (Light, 1989)

Communicative competence depends on

- Knowledge, judgment, and skills in four interrelated domains
  - Linguistic
  - Operational
  - Social
  - Strategic

Linguistic domain

- Language skills are the foundation of communicative competence
  - Skills in the language(s) spoken by the family and community
    - Receptive
    - Expressive
  - Skills in the "language" code of the AAC system(s)
    - Content, form, use

Intervention to build linguistic competence

- Provide **early** intervention
  - Too often "early" intervention is not early
  - 80% of children are > 2 years old when they receive AAC services (Hustad, et al., 2005)
  - As a result, these children have no means of communication during critical stages of dev't
  - They fall further and further behind their peers

Effects of AAC intervention

- Don't wait to provide AAC intervention
  - Research demonstrates that AAC interventions have positive effects on
    - Communication, language, literacy, and behavior
  - These benefits come at no risk to speech development
    - Meta-analyses consistently demonstrate that AAC does <u>not</u> impede speech development (Millar, Light & Schlosser, 2006; Schlosser & Wendt, 2008)
- Provide early AAC intervention for children at risk from birth

Intervention to build linguistic competence

- Focus on motivating and meaningful contexts within the natural environment
  - Numerous opportunities for communication
    - Not just expression of needs and wants
    - But rather opportunities for sustained social interaction
  - Involve parents and families as well as daycare/ school teams

Intervention to build linguistic competence

- Provide access to a rich language environment
  - Introduce wide range of concepts
    - Not just object labels, but also questions, social expressions, relational terms
  - Provide access to concepts via AAC
    - Do not require children to prove knowledge first
    - Support children in learning language via AAC
  - Add vocabulary on a daily basis

Intervention to build linguistic competence

- Provide opportunities for communication
  - Pause and wait
- Model AAC & speech
  - Speech & sign
  - Speech & aided AAC
- Respond to child's communicative intent
  - Expand & model more complex language

Intervention to build linguistic competence

- Introduce literacy skills early
  - Use literacy to teach language concepts, syntax & morphology
- Intervention to teach literacy skills
  - Direct instruction in basic skills
    - Phonological awareness, letter sound correspondences, single word decoding, sight word recognition
  - Numerous opportunities to apply skills in meaningful & motivating reading activities

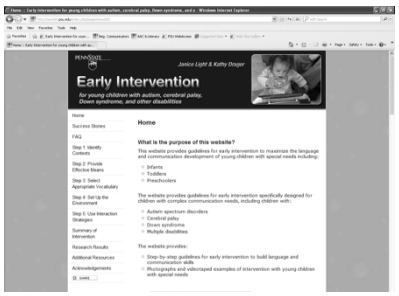
Results of intervention to build language/literacy skills

- With early AAC intervention, children with CCN demonstrate
  - Significant increases in their rates of turn taking
  - Significant growth in their expression of concepts
    - AAC provides a powerful visual support to facilitate language learning
- As children with CCN learn literacy skills, they also demonstrate significant gains in language
  - Gains in syntax and morphology

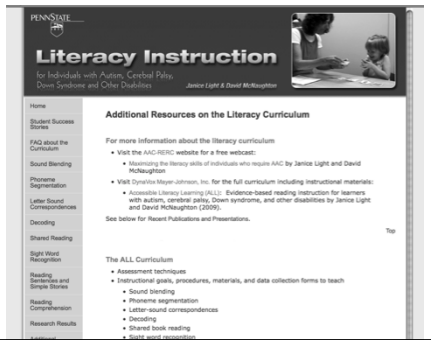
Summary of intervention to build language skills

- Start early
- Focus on meaningful & motivating activities in the natural environment
- Provide access to a rich language environment /effective means to communicate
  - Introduce literacy skills early
- Provide opportunities for communication
  - Pause and wait
- Model AAC & speech
- Respond to child's communicative intent

Early intervention for young children with autism, cerebral palsy, Down syndrome & other disabilities
Website at http://aackids.psu.edu



For further information on literacy intervention, visit http://aacliteracy.psu.edu



The development of communicative competence

- Rests on knowledge, judgment, and skills in four interrelated domains:
  - Linguistic
  - **Operational**
  - Social
  - Strategic

Operational domain

- Skills in the technical production, operation & use of AAC systems
  - Skills to produce hand (or body) shapes, positions, orientations, & movements required for unaided systems
  - Skills to technically operate & use aided AAC systems
    - Low tech & high tech systems

Intervention to maximize operational competence

- In order to maximize operational competence,
  - AAC systems should impose minimal learning demands
- Current AAC technologies reflect the conceptual models of nondisabled adults
  - As a result, many AAC systems are not developmentally appropriate for children
- Need to re-think the design of AAC systems
  - Reduce the learning demands for children

Re-thinking AAC displays

- Why do we design AAC displays for children in the way we typically do?
  - Are we handicapping young children in their language development?



Re-thinking AAC symbols

PCS for "big"

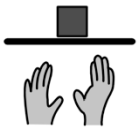
- 0% correct
  - Others thought it was "ants", "sludge", "coloring", "blacktop for basketball", "chocolate", "germs", etc

Child's representation of "big"
Most of the children drew a person that was big –powerful, capable

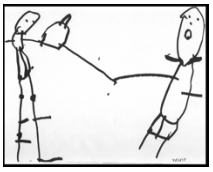
Re-thinking AAC symbols

PCS for "want"

- Only 4% correct
  - Others thought it was "a TV", "cut off hands", "hands and soap", etc



Child's representation of "want"

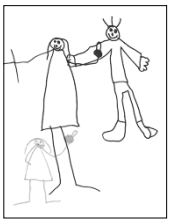


Re-thinking AAC symbols

PCS for "who"

- 0% correct
  - Others thought it was "a back of a head", "a boy eating spaghetti", "a hair cut", "a 7 with ears", etc

Child's representation of "who"
"Girl says, 'Mom, who is that?' 'This is your new daddy.'



Children's representations differ significantly from AAC symbols

- Preschoolers represent language in very different ways than traditional AAC symbols
  - Reflect very different underlying conceptualizations/ meanings
  - Include depictions of entire scenes or events
    - Embed the concepts in context
  - Include complete objects / people in these scenes
    - Do not include "parts" of objects or people
  - Usually include familiar people, objects & experiences
- Results robust across different cultural groups

Traditional AAC displays

TRADITIONAL GRID LAYOUT

- Each language concept is represented by separate AAC symbols in "boxes" organized in rows & columns
- Language is taken out of context
- Understanding symbols relies on semantic memory
- Each representation must be processed separately, understood, & then integrated

GRID FOR "PLAYING TELEPHONE"

Re-thinking the design of AAC displays for young children

- Are traditional grid displays appropriate for young children with complex communication needs?
- Are there better ways to represent language concepts for young children?
- Are there better ways to organize language in AAC displays for young children?
- How can we reduce the learning demands for young children?

Alternative approach to AAC displays Visual scene displays

VISUAL SCENE DISPLAY (VSD)

- Vocabulary embedded under "hot spots" in integrated visual scene
- Language is presented in meaningful context
- Scene is processed as an integrated unit
- Meaning is derived from the entire scene

VSD FOR "PLAYING TELEPHONE"

Research on layout of AAC displays

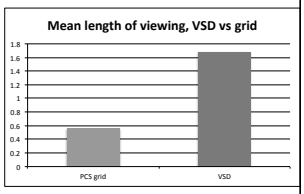
- Series of studies to investigate the effects of different layouts
  - Grid displays
  - Visual scene displays
- Investigate performance of children across various developmental stages
  - Infants (9-12 months old)
  - Toddlers (2 ½ years old)
  - Preschoolers (4 & 5 year olds)

Research on the effect of type of display

- Infant study (Wilkinson & Light, in progress)
  - 4 different contexts familiar to infants
    - Feeding, bathing, playing ball, etc
  - Infants viewed pairs of displays for each context
    - E.g., PCS grid vs. photo VSD
    - Position & order counterbalanced
  - Eye tracking technology
    - Measure visual attention / interest

Type of display affects visual attention of infants

- Infants looked first & longest at photo VSD compared to PCS grid
- Infants at "first words" stage demonstrated strong preference for photo VSDs



Type of display affects performance

- Toddlers were more accurate locating vocabulary using VSDs than grid displays (Drager, Light, et al., 2003)
- It was not until 4 & 5 years of age that children performed with similar accuracy using VSDs or grid displays (Light, et al., 2004)

Type of display affects performance

- With appropriate intervention, preschoolers with CCN can acquire basic literacy skills
  - Require access to traditional orthography (Light & McNaughton, 2009)

Implications for designing AAC displays for young children

- Results suggest that VSDs may be better suited than grid displays for
  - Infants, toddlers, younger preschoolers
  - Other beginning communicators (under age 4 - 5 developmentally)
- Compared to traditional grid displays, VSDs
  - Attract more visual attention
  - Result in more accurate performance locating vocabulary
  - Seem to support more rapid lexical development / language learning

Potential advantages of VSDs for young children

- VSDs represent familiar events and activities
  - replicate the contexts in which children learn language
- Language concepts are presented in context
  - provide support for understanding & learning
  - support access to language via episodic memory
- VSDs preserve conceptual & visual relationships between people & objects that occur in life
  - preserve the location, function, proportionality of concepts
- VSDs provide motivating & interesting contexts
  - stimulate interaction
- VSDs also seem to offer visual processing advantages
  - regularly process scenes visually within daily life
  - rapidly process scenes (<200 milliseconds)

What are the key components of VSDs?

- Young children's early language learning experiences are centered on communicative interactions with familiar adults.
  - It is therefore important to include these people and events as key component in VSDs.
- Including people in VSDs promotes visual attention and interest
  - People in scenes have a powerful effect on visual attention (Wilkinson & Light, 2011)

People in scenes have a powerful effect on visual attention

ORIGINAL VSD

VIEWING PATTERN

VSDs should include people engaged in meaningful activities

Implications for practice

- Minimize operational costs and maximize power of communication by designing developmentally appropriate AAC systems
  - Individuals at the early stages of language development benefit from
    - VSDs that include photos /familiar images of people engaged in meaningful & motivating events
  - At later stages of development, children require access to AAC technologies that
    - Provide access to traditional orthography
    - Support more advanced language & literacy development

Additional resources

- For more information on designing AAC systems for young children with complex communication needs, see the webinar at
  - http://www.atia.org/i4a/pages/index.cfm?pageid=3989
- Or visit our AAC at Penn State website for further information
  - http://aac.psu.edu

Communicative competence depends on

- Knowledge, judgment, and skills in four interrelated domains:
  - Linguistic
  - Operational
  - **Social**
  - Strategic

Social domain

- Sociolinguistic skills
  - E.g., Discourse skills
    - E.g., turn taking, initiation/ responses
  - Communicative functions
- Sociorelational skills
  - knowledge, judgment, and skills in the *interpersonal* aspects of communication

Sociorelational Skills (Light, Arnold, & Clark, 2003)

- Participating actively in interactions
- Being responsive to partners
- Demonstrating interest in partners
- Putting partners at ease
- Projecting a positive self-image
- Engaging partners in interaction
- Maintaining a positive rapport

Challenges in the Development of Sociorelational Skills

- Individuals with CCN
  - May lack the means to demonstrate sociorelational skills
  - May lack the social experiences required to develop these skills
  - May experience specific deficits in social development
  - May not receive appropriate intervention to teach these skills

Intervention to build sociorelational skills

- Partner-focused questions are a powerful means to build social competence
- PFQs focus on the partner's interests, activities, feelings, etc.
  - Serve to put the partner at ease
  - Demonstrate interest in partner/ other orientation

Intervention procedures

(Light & Binger, 1998; Light, Binger, Agate, & Ramsay, 1999)

- Identify appropriate interaction contexts
- Provide appropriate vocabulary to ask PFQs
- Provide guided practice in PFQs using least to most prompting hierarchy
  - Natural cue
  - Expectant delay
  - Point
  - Model
- Provide opportunities for practice in varied contexts in natural environment to build generalization & maintenance

Effects of intervention to build sociorelational skills

- After intervention, participants
  - Demonstrated acquisition of the target skill
    - Asking partner-focused questions
  - Participated in longer & more frequent interactions
  - Were perceived to be more competent communicators
    - By themselves
    - By familiar partners
    - By observers naïve to AAC

Communicative competence depends on

- Knowledge, judgment, and skills in four interrelated domains:
  - Linguistic
  - Operational
  - Social
  - **Strategic**

Strategic domain

- Individuals who require AAC will encounter limitations in their development of linguistic, operational, and social skills
- They will require strategies to allow them to bypass these constraints and make the best of what they do know and can do
  - Temporary strategies
  - Long term strategies

Examples of strategies
(Mirenda & Bopp, 2003)

- Difficulty understanding the partner
  - Ask partner to slow down or augment input
- Word or phrase not available
  - Ask partner to "guess"; use another mode; paraphrase
- Rate of communication too slow
  - Ask partners to predict; use telegraphic messages
- Partner is uncomfortable
  - Use an introductory message; use humor

Intervention to build strategic competence

- In daily life, individuals with CCN encounter significant challenges at home, at school, at work, and in the community.
- A mentor is someone who acts as a trustworthy resource to turn to when there is a problem.
  - Ideally a mentor is someone who has "been there" and overcome the challenge.
- A mentor is someone who provides "a brain to pick, a shoulder to cry on, and a kick in the pants."

The AAC Mentor Project
(Light, McNaughton, Krezman, Williams, et al., 2002)

- Leadership Training (online) for adults who used AAC
  - To develop skills as effective mentors
  - To build leadership capacity
- Mentor Program (via E-mail)
  - To link adolescents and young adults with adults who also used AAC as mentors
  - To support adolescents and young adults who use AAC in solving problems, meeting personal goals, and developing strategic competence

AAC Mentor Project: Leadership Training

- 31 adults with CP participated
  - 20-48 years old (mean = 32 years old)
  - All had functional literacy skills
- Self-paced online intervention designed
  - To develop positive and effective interpersonal communication skills
  - To develop collaborative problem solving skills
  - To teach strategies to facilitate access to disability-related information and resources

Intervention to build effective interpersonal communication skills

L	Listen and communicate respect
A	Ask questions
F	Focus on what your partner is saying

Intervention to build collaborative problem solving skills

D	Describe the specific problem or goal
O	Outline lots of ways to solve the problem or meet the goal
I	Identify the consequences of each plan and choose the best plan
T	Take action
!	Celebrate success when your partner meets the goal

Intervention procedures & results

- Procedures for strategy instruction
  - Demonstrate benefits of strategy use
  - Outline strategy steps
  - Provide models of strategy use
  - Provide practice in strategy use
  - Provide feedback
  - Provide opportunities for generalization
- All participants acquired the target strategies successfully

AAC Mentor Program

- Adolescents & young adults who used AAC choose mentors who used AAC to provide
  - Access to role models
  - Encouragement & social support
  - Collaborative problem solving and goal setting
  - Access to relevant resources

Topics discussed

- Mentors and adolescents /young adults discussed a wide range of topics
  - Community involvement
  - Education
  - Friendships/ relationships
  - AAC and communication
  - Family
  - Independent living /aides
  - Employment
  - Financial issues, etc.

AAC mentor program results

- Goal attainment
  - Proteges set a total of 80 goals with their mentors
    - Attained 32%
    - Made progress toward 51%
    - Did not make progress toward 16%

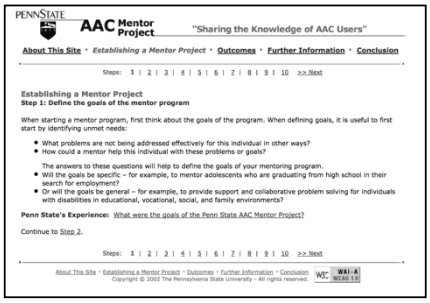
AAC Mentor Program Satisfaction / Social validation

- 96% of protégés were very satisfied; they liked
  - Talking to someone who understood
  - Sharing experiences
  - Getting new ideas for doing things
  - Being "a part of something"
- 97% of mentors were very satisfied; they liked
  - Helping someone else
  - Sharing similar experiences
  - Meeting someone new

- Falling in love, starting a new school, starting a new job, changing communities or homes, mastering a skill, learning a new piece of assistive technology - all are easier and more fun if the experience can be shared with and guided by someone who has "been there"
  - Michael Williams

http://mcn.ed.psu.edu/~mentor/

(Light, McNaughton, Krezman, Williams, et al., 2002)



PENNSTATE AAC Mentor Project "Sharing the Knowledge of AAC Users"

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Establishing a Mentor Project
Step 1: Define the goals of the mentor program

When starting a mentor program, first think about the goals of the program. When defining goals, it is useful to first start by identifying unmet needs:

- What problems are not being addressed effectively for this individual in other ways?
- How could a mentor help this individual with these problems or goals?

The answers to these questions will help to define the goals of your mentoring program.

- Will the goals be specific – for example, to mentor adolescents who are graduating from high school in their search for employment?
- Or will the goals be general – for example, to provide support and collaborative problem solving for individuals with disabilities in educational, vocational, social, and family environments?

Penn State's Experience: What were the goals of the Penn State AAC Mentor Project?

Continue to Step 2.

Steps: 1 | 2 | 3 | 4 | 5 | 6 | 7 | 8 | 9 | 10 >> Next

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Integration of skills across domains

- Communicative competence depends on the integration of knowledge, judgment and skills across linguistic, operational, social and strategic domains
  - Linguistic and operational skills provide the **tools** for communication
  - Social and strategic skills focus on **effective use** of these tools in interactions
- Attainment of communicative competence is a complex process that requires concerted intervention

The art and the science of building communicative competence

- Building communicative competence with individuals who require AAC requires both science and art
  - The science
    - Research that advances understanding and practice
  - The art
    - The belief and the commitment to the right of all individuals to express themselves fully and seek their full potential

For more information, visit http://aac.psu.edu

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